

## Notes on Malagasy psyllids with a redescription of *Acizzia lemurica* (Šulc), comb. nov.

(Insecta, Homoptera, Psylloidea)

By I. D. Hodkinson

Hodkinson, I. D. (1993): Notes on Malagasy psyllids with a redescription of *Acizzia lemurica* (Šulc), comb. nov. (Insecta, Homoptera, Psylloidea). - Spixiana **16/2**: 127-131.

This paper details psyllids from Madagascar in the Snow collections, University of Kansas. The previously unknown male of *Psylla lemurica* (Šulc, 1908) is described and the species is transferred to *Acizzia* Heslop-Harrison, 1949, 1961 comb. nov. Additional material in the Natural History Museum, London indicates that *A. lemurica* is widespread in central Africa, occurring in Cameroon, Angola, and Kenya on *Albizia gummifera*.

*Trioza malagasyana* spec. nov., a species close to *Trioza tundavala* Hollis, 1984, is described. Adults are morphologically similar to Neotropical *Neolithus* Scott, 1882 and share what might be interpreted as several convincing synapomorphies. However, nymphs of this *tundavala*-group are very different from those of *Neolithus*, suggesting that adult similarity represents convergence rather than phylogenetic relationship.

Prof. I. D. Hodkinson, School of Biological and Earth Sciences, Liverpool John Moores University, Byrom St., Liverpool L3 3AF, U.K.

### Introduction

This paper describes interesting species of Malagasy psyllids in the Snow Entomological Museum, University of Kansas (SEMUK). They include the hitherto unknown male of *Psylla lemurica* Šulc, 1908 and a new *Trioza* species that closely resembles the Neotropical genus *Neolithus* Scott, 1882.

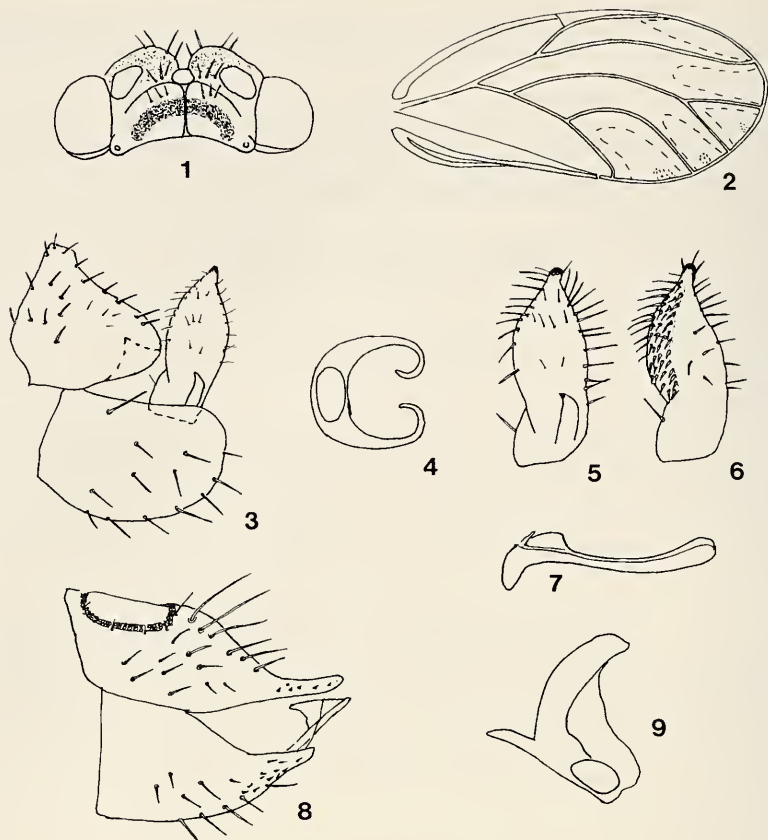
Šulc (1908) described *Psylla lemurica* from a single female of which only a fragment of the forewing remains (Lauterer pers. comm.). In the absence of males its relationships have remained obscure. Male specimens described below indicate that *P. lemurica* belongs to the Old World legume-feeding genus *Acizzia* Heslop-Harrison, 1949, 1961, comb. nov. Further unrecognised material in the Natural History Museum, London (BMNH) shows that the species is widespread in the Afrotropical region, where it has been collected from *Albizia gummifera*.

*Trioza malagasyana*, spec. nov., described below, is close to *Trioza tundavala* Hollis, 1984 an Angolan species that forms galls on *Syzygium benguellense* (Myrtaceae). Adults of these two species closely resemble members of the Neotropical genus *Neolithus* which feed on *Sapium* (Euphorbiaceae) and a convincing set of apparent synapomorphies can be defined. However, larvae of the *tundavala* group are very different from those of *Neolithus*, suggesting that adult similarity represents strong evolutionary convergence rather than phylogenetic relationship.

### *Acizzia lemurica* (Šulc, 1908), comb. nov.

Figs 1-9

Material examined. 2♂, 2♀, Madagascar, Tamatave Province, Andasibe (Perinet), 2-4.xi.1984, sweeping vegetation (Brooks) (SEMUK); 1♂, La Mandraka, Institut Scientifique (Krauss) (BMNH). Also 7♂, 8♀, Cameroon, Angola and Kenya (BMNH).



Figs 1-9 *Acizzia lemurica* (Šulc). 1. Head, dorsal view. 2. Forewing. 3. ♂ terminalia, lateral view. 4. ♂ proctiger, dorsal view. 5. ♂ left paramere, outer view. 6. ♂ right paramere, inner view. 7. ♂ aedeagus, distal segment. 8. ♀ terminalia, lateral view. 9. Metacoxa, showing meracanthus. Size measurements are given in text.

### Redescription

Specimens examined conform exactly to the original description. The additional diagnostic features, primarily of the male, described below, indicate that the species is a member of the genus *Acizzia* (see Hodkinson & Hollis, 1987).

Size (in mm). Head width ♂ 0.80-0.84, ♀ 0.88. Antennal length ♂ 2.12, ♀ 2.35. Forewing length ♂ 2.69-2.81, ♀ 3.14. Proctiger length ♂ 0.22-0.23, ♀ 0.76. Paramere length ♂ 0.24-0.25. Distal segment of aedeagus length ♂ 0.19-0.21. Circumanal ring length ♀ 0.23.

Colour. General body colour dark reddish brown throughout except vertex and pronotum paler yellow with dark brown markings, those on the vertex forming a characteristic semicircular band (Fig. 1). Wings membranous, clear.

Head (Fig. 1) with short, rounded genal processes; frons exposed, not enveloped by genae; antennae 10-segmented, long and slender, 2.53-2.65 times head width, segment 3 longest, with a single rhinarium at the apices of segments 4, 6, 8 and 9. Thorax robust, appearing somewhat more compressed than in many *Acizzia*, with head closely adpressed and deflexed downwards at an angle of 45 degrees to thorax. Forewing (Fig. 2) membranous, oblong oval, 2.27-2.65 times as long as broad, costal break present, pterostigma short and narrow, gradually tapered; cell  $cu_{1a}$  relatively large, strongly arched, leaning towards base of wing; radular spinules present. Metacoxa (Fig. 9) with long slender meracanthus; metatibia, 0.97-1.04 times head width, with conspicuous genual spine and 4+1 thick black apical spurs; basal metatarsus with 2 such spurs.

Male proctiger in lateral view (Fig. 3) with characteristic triangular processes which are recurved inwards at the apex such that they appear curled in dorsal view (Fig. 4). These incurved apices are probably homologous with the separate finger-like processes that occur in Australian species such as *Acizzia acaciaeballeyanae* (Froggatt). Subgenital plate slightly elongate. Paramere (Figs 5,6) elongate pyriform, with a slender sclerotized apex and a small, separate, basal, outer posterior process that terminates in an anteriorly-directed hook; anterior lobe of paramere with a field of stout setae along inner anterior border. Aedeagus (Fig. 7) with apex elongate and somewhat reniform.

Female terminalia in lateral view (Fig. 8) elongate wedge-shaped. Basal part of proctiger rounded and somewhat swollen, strongly stepped, merging into narrow thin apical part; proctiger with elongate setae dorsally, 0.86 times head width; subgenital plate acute apically, triangular in lateral view; circumanal ring moderately large consisting of a double row of pores.

Host plant. Probably *Albizia gummifera*.

Diagnosis. *Acizzia lemurica* can be separated from other members of the genus by the incurved male proctiger, the steeply stepped female proctiger, the form of the male paramere and aedeagus and the characteristic curved banding pattern on the vertex.

### *Trioza malagasyana*, spec. nov.

Figs 10-15

Type. Holotype: ♀, Madagascar, Tamatave Province, Andasibe (Perinet), 2-4.xi.1984, sweeping vegetation (Brooks), mounted on slide (SEMUK).

#### Description

Size ♀ (in mm). Head width 0.91. Antennal length 2.10. Forewing length 4.84. Hindwing length 2.47. Proctiger length 0.62. Circumanal ring length 0.10.

Colour. General body colouration dark brown to blackish throughout, antennae slightly lighter. Forewing clear, with basal darkened patch and infuscation along vein R, veins brown.

Large species, with wings appearing much longer than body.

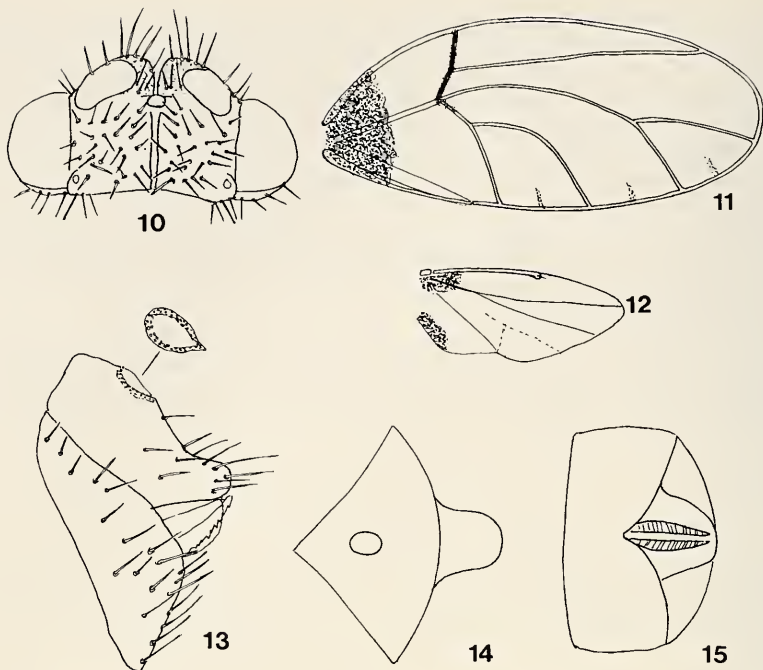
Head (Fig. 10) relatively small, much narrower than width of mesothorax, less than length of metatibia; vertex quadrate, with long scattered setae; genae developed into rounded lobes on underside of head, not completely enveloping frons; antennae inserted on dorsal surface of these lobes, 2.33 times head width, 10-segmented, with a single rhinarium at the apices of segments 4, 6, 8, and 9, segment 3 the longest, a few scattered short setae present subapically on each segment; occiput with long hairs. Clypeus globular, labium long and slender.

Thorax covered in long, moderately dense setae; pronotum narrow, collar-like, tilted forwards. Forewing (Fig. 11) with typical triozone venation, broadly rounded at apex, 5.33 times head width; trifurcation situated close to wing base, vein  $R_s$  arising from about mid-point of vein  $R_1$ , the latter infuscate; cell  $m_{1+2}$  smaller than  $cu_{1a}$ , the latter tall and narrow with a short petiole; radular spinules present, surface spinules absent; veins with scattered long setae. Hind wing (Fig. 12) small, about half the length of forewing. Legs robust, densely hairy; metacoxa with long slender meracanthus; metatibia lacking genual spine and with 1+(2-3) thick black apical spurs; basal metatarsus without spurs.

Male terminalia unknown. Female terminalia in lateral view (Fig. 13) short, proctiger overhanging the subgenital plate, broad basally, descending to a short, broadly rounded terminal process bearing scattered long setae; in dorsal view (Fig. 14) appearing like a segment of a circle with a narrower symmetrical domeshaped process at the apex; circumanal ring small, 0.17 times length of proctiger, formed from a double row of small, widely spaced pores; subgenital plate in ventral view (Fig. 15) notched apically; valvulae ventralis stout and straight appearing like a saw blade in lateral view (Fig. 13) but appearing obliquely grooved in ventral aspect.

Host plant. Unknown

Diagnosis. *Trioza malagasyana* is closest to *Trioza tundavala* Hollis, 1984 from which it can be separated by the more extensive dark patch at the base of the forewing, the larger cell  $cu_{1a}$  and the form of the female proctiger, subgenital plate and valvulae ventralis. Both these species closely resemble Neotropical *Neolithus* (including an undescribed species from Costa Rica in the BMNH) in the following



Figs 10-15. *Trioza malagasyana*, spec. nov. 10. Head, dorsal view. 11. Forewing. 12. Hindwing. 13. ♀ terminalia, lateral view. 14. ♀ terminalia, dorsal view. 15. ♀ terminalia, ventral view. Size measurements are given in text.

adult characters (see Burckhardt, 1988 for redescription of *Neolithus*): 1. large size; 2. apex of forewing rounded; 3. forewing with basal dark patch; 4. forewing with infuscation along vein R; 5. trifurcation of forewing veins close to wing base; 6. shape and position of cell  $cu_{1a}$ ; 7. head small, much narrower than width of thorax; 8. genae not forming forwardly-directed processes, at most forming rounded swellings on underside of head; 9. hindwing about half the length of forewing; 10. head, thorax and wing veins with long conspicuous setae; 11. female circumanal ring very small. The only significant differences lie in the female terminalia, antennae and minor details of the forewing venation. The terminalia of *Neolithus* are elongate and wedgeshaped whereas those of the *Trioza*'s are short and rounded with an apically notched subgenital plate and characteristic valvulae ventralis which are stout, straight and transversely grooved apically. The antennae of *Neolithus* are stouter and bear numerous elongate setae which exceed the width of the antennal flagellar segments. Furthermore, vein  $R_s$  of the forewing in *Neolithus* arises closer to the point of trifurcation. By contrast with the adults, larvae of *Neolithus* differ markedly from those of the African *Trioza*, which are of the typically flattened, disc-shaped triozone type, with well-developed humeral lobes on the forewing pads and sectasetae present (see Hollis, 1984). *Neolithus* larvae are not flattened, lack the humeral lobe and sectasetae, and have a more angular apex to the abdomen. It therefore appears likely that adult similarity reflects convergence rather than phylogenetic relationships.

Several of the diagnostic characters listed above also recur in other groups of Myrtaceae-feeding Triozidae from India, S.E. Asia, Australia and the Pacific but always in combination with different character sets (see Hodkinson 1983, 1986, Tuthill & Taylor 1955, Taylor 1985, 1987 for complete list of species). Thus, for example, Hawaiian *Kuwayama* and *Trioza* sensu lato and Australian *Schedotrioza* often have rounded wings, *Trioza vitiensis* Klyver has several similar characters and *Trioza alifumosa* Klyver has a darkened wing-base and stout valvulae ventralis with transverse grooves. Similarly, *Trioza fusca* Mathur and *T. jambolanae* Crawford have female terminalia that resemble those of *T. malagasyana* but the head and forewing are different. The degree of character homoplasy makes the study of phylogeny within these groups difficult.

## Acknowledgements

I thank Dr. Robert Brooks (University of Kansas) and Mr. David Hollis (The Natural History Museum, London) for arranging the loan of material from their respective institutions.

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